

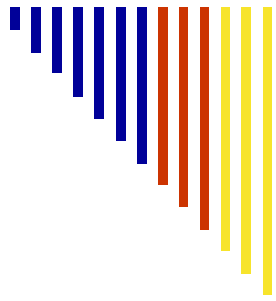
Renewable Energy Technologies

Climate Action Team Technology

Symposium 6-28-06

Barry Cinnamon

President, California Solar Energy Industries
Association (CAL SEIA)



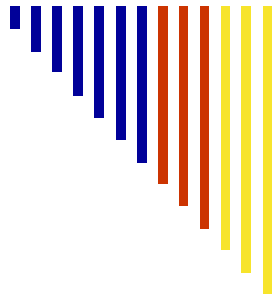
CAL SEIA Overview

- Founded in 1977
- 150 Member Companies Representing 3,000 California Employees
- Largest State Solar Trade Association
- Solar Electric and Solar Thermal
- Contractors, Manufacturers, Distributors and Consultants



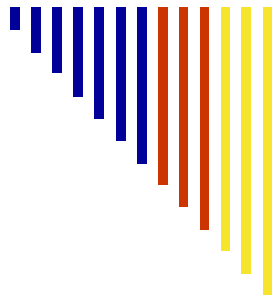
California Solar Incentive Program (CSIP)

- Assures Long Term Industry Investment
- Incentives Leverage Customer Purchases (2/3s)
- \$6+ Billion Net Benefits from CSIP
 - \$7B Energy Infrastructure
 - \$1.5B Economy
 - \$0.5B Environment
 - \$3B Incentive Costs
 - Source: Akeena/CAL SEIA White Paper



Technology Opportunities

- Lowest Cost per Installed Watt
 - Cheaper per watt not always best
 - Installation costs proportional to area
- Highest Output per Square Foot
 - Power a building with available roof space
 - Market rewards high efficiency



Modules – Crystalline Silicon



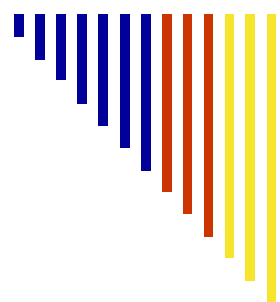
- Sunpower, Sharp, etc. continued evolutionary efficiency improvements
- Silicon shortage will end



Modules – Thin Film



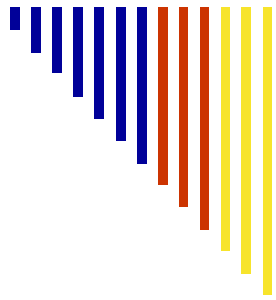
- Unisolar, Nanosolar, etc.
- Low \$/watt
- Lower efficiency, more area, higher installation costs
- Lifecycle stability



Typical \$24,000 Residential System (3 KW dc)

- Modules \$11,000 – Historic Focus
- Installation \$3,900 – Contractor Efficiency
- BOS \$3,300 – Excellent Potential
- Sales & Marketing \$3,300 - Customer Awareness
- Sales Tax \$1,200 – Exemption?
- Engineering and Permits \$1,500 – \$78 to \$1,800

Tremendous Opportunities for Cost Savings



Balance of System

□ Racking

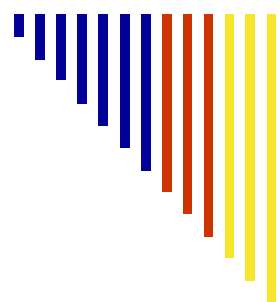
- Aluminum modules, aluminum racks, aluminum clips

□ Wiring

- Module wiring, ground wiring, conduits, junction boxes, wire management

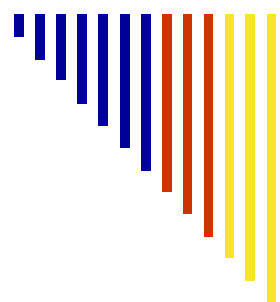
□ Inverters

- Most expensive and failure prone single component



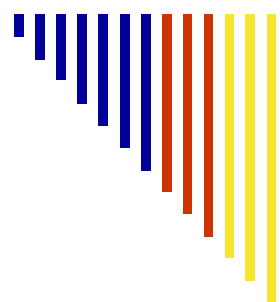
Marketing, Sales and Installation

- Customer Awareness
- Similar to Flex Your Power campaign
- Industry Consolidation
- Production-oriented installation companies



Solar Attracting California Investments

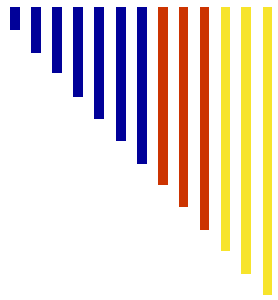
- Financings and IPOs Queuing Up
- Sunpower (recent IPO)
- Nanosolar (\$100m production facility)
- Applied Materials Buys Applied Films
- Clean Tech and Renewable Energy Funds



Regions Thrive Based on Market Opportunities

- *Automobiles (Detroit)*
- *Minicomputers (Route 128)*
- *Chips/Software (Silicon Valley)*
- *Energy Technology (California?)*

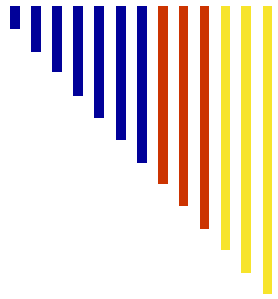
***Japan and Germany Lead in Solar Today –
Catalyzed by Domestic Demand***



Economics Leads us to Solutions

- Free Market Signals
 - Energy Pricing Reflects True Costs
 - Green House Gas – Carbon Tax/RECs
- Market Benefits
 - Economy
 - Environment
 - Energy Independence

By 2007 we expect that more silicon will be used for solar panels than the entire semiconductor industry



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